IN THE CLAIMS:

Claims 1 through 37 have been amended herein. Also, new claims 38-50 have been added. Please note that all claims currently pending and under consideration in the referenced application are shown below. Please enter these claims as amended. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently amended) A ~~machine-implemented~~ method for simulating the ~~placing~~ placement of a plurality of unplaced particles, the method comprising:

selecting a plurality of unplaced particles;

wherein each of the plurality of unplaced particles ~~having~~ exhibits a characteristic dimension, ~~to create a particle pack, the plurality of particles comprising~~ corresponding to N categories of the plurality of unplaced ~~particles,~~ particles;

wherein the characteristic dimension of each of the plurality of unplaced particles of a given category of the N categories ~~being~~ is different from the characteristic ~~dimensions~~ dimension of each of the plurality of unplaced particles of other ~~ones~~ of the N categories; ~~categories, the characteristic dimension of the particles increasing as the category N increases, the method comprising:~~

~~a)~~ defining a central string, a space disposed about the central string, and N ~~concentric~~ subspaces disposed about the central string and within the space, wherein each of the N subspaces ~~corresponding~~ corresponds to one of the N ~~particle~~ categories, respectively;

~~b)~~ selecting a particle from the plurality of unplaced particles;

~~c) placing the selected particle in the corresponding subspace so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is in non-overlapping relation with other placed particles,~~

~~the selected particle placement including~~ defining a catch net representative of buoyancy of a portion of ~~the~~ a plurality of placed particles and positioning the catch net within the space based upon the placement of the portion of the plurality of placed ~~particles,~~ particles;

~~the selected particle placement further including~~ defining a water level representative of a level of a portion of the plurality of placed particles that are smaller than the selected ~~particle~~particle; ~~and represent a surface of the smaller placed particles, and positioning the water level within the space based upon the smaller particle surface,~~

simulating placement of the selected particle within a corresponding subspace so that the selected particle is positioned in a non-overlapping relationship with respect to the plurality of placed particles, ~~the selected particle being placed in non-overlapping relation with respect to~~ the catch ~~net~~ net, and the water level; and

~~d) repeating~~repeatedly ~~the particle selection (b) and placement (c)~~selecting another particle from the plurality of unplaced particles and simulating placement thereof until placement of each of the plurality of unplaced particles ~~of the plurality of particles has become one of the placed particles~~ has been simulated.

2. (Currently amended) A ~~machine implemented~~ method for ~~placing~~ simulating the placement of a plurality of unplaced particles, the method comprising:

selecting ~~each~~ a plurality of unplaced particles;

wherein each of the plurality of unplaced particles ~~having~~ exhibits a characteristic dimension, ~~to create a particle pack, the plurality of particles comprising~~corresponding to N categories of the plurality of unplaced ~~particles,~~ particles;

wherein the characteristic dimension of each of the plurality of unplaced particles of a given category of the N categories ~~being~~ is different from the characteristic ~~dimensions~~ dimension of each of the plurality of unplaced particles of other ~~ones~~ of the N categories;~~categories, the characteristic dimension of the particles increasing as the category N increases, the method comprising:~~

~~a)~~ defining a central string, a space disposed about the central string, and N ~~concentric~~ subspaces disposed about the central string and within the space, wherein each of the N subspaces ~~corresponding~~ corresponds to one of the N ~~particle~~ categories, respectively;

~~b)~~ selecting a particle from the plurality of unplaced particles;

defining a catch net representative of a buoyancy of a portion of a plurality of placed particles and positioning the catch net within the space based upon the placement of the portion of the plurality of placed particles;

~~c)~~ simulating ~~placing~~ placement of the selected particle ~~at a particle location unique to the selected particle in~~within ~~the~~ a corresponding subspace so that the selected particle ~~becomes a placed particle at a particle location unique to that placed particle and~~ is positioned in a non-overlapping ~~relation~~ relationship with ~~other~~ respect to the plurality of placed particles ~~particles, the selected particle placement including defining a catch net representative of buoyancy of a portion of the placed particles and positioning the catch net within the space based upon the placement of the portion of the placed particles, the selected particle being placed in non-overlapping relation with respect to~~and the catch net; and

~~d)~~ ~~repeating~~ repeatedly selecting another particle from the plurality of unplaced particles and simulating placement thereof~~the particle selection (b) and placement (c)~~ until placement of each of ~~the particles of~~ the plurality of unplaced particles has ~~become one of the placed particles~~been simulated.

3. (Currently amended) The ~~A~~ method as recited in claim 2, wherein each of the plurality of unplaced particles ~~comprise~~ comprises a ~~spheres~~ sphere and the characteristic dimension of each of the plurality of unplaced particles comprises a radius.

4. (Currently amended) The ~~A~~ method as recited in claim 2, wherein selecting the particle from the plurality of unplaced particles ~~the particle selection~~ comprises randomly selecting the ~~selected~~ particle from the plurality of unplaced particles.

5. (Currently amended) ~~A~~ The method as recited in claim 2, ~~wherein~~further comprising:

~~the method further includes~~ defining a pack surface for the plurality of placed particles; and

~~the catch net positioning comprises~~ positioning the catch net relative to a position of the pack surface.

6. (Currently amended) The ~~A~~ method as recited in claim 5, wherein positioning the catch net relative to the pack surface ~~the catch net positioning~~ comprises positioning the catch net at a distance away from the pack surface based upon a selected particle radius.

7. (Currently amended) The ~~A~~ method as recited in claim 5, wherein:
the plurality of placed particles ~~comprise~~ include a top layer; and
the position of the pack surface comprises an average of ~~the~~ a particle ~~locations~~ location of each of the plurality of placed particles in the top layer thereof.

8. (Currently amended) The ~~A~~ method as recited in claim 5, wherein:
each of the plurality of placed particles has a south pole ~~located at a south pole position~~;
the plurality of placed particles ~~comprise~~ include a top layer ~~of the placed particles~~; and
the pack surface corresponds to the south poles of the top layer placed particles.

9. (Currently amended) The ~~A~~ method as recited in claim 8, wherein the ~~particle~~ pack surface corresponds to an average of the south pole positions of ~~the top layer~~each of the plurality of placed particles of the top layer.

10. (Currently amended) The ~~A~~ method as recited in claim 2, wherein:
~~the space has a cross sectional area substantially perpendicular to the central string; and~~
the catch net extends across ~~the cross sectional area of~~ the space substantially perpendicularly to the central string.

11. (Currently amended) The ~~A~~ method as recited in claim 2, wherein:
~~each of the subspaces has a cross sectional area substantially perpendicular to the central string; and~~
the catch net extends across ~~the cross sectional areas of~~ each of the subspaces substantially perpendicularly to the central string.

12. (Currently amended) The ~~A~~ method as recited in claim 2, wherein:

each of the subspaces ~~has a cross sectional~~extends ~~area~~ substantially ~~perpendicular~~ perpendicularly to the central string; ~~and~~

the catch net comprises N ~~subnets,~~ subnets; and

~~one~~ each of the N subnets ~~corresponding~~ corresponds to each of the N subspaces, respectively.

13. (Currently amended) The ~~A~~ method as recited in claim ~~13~~12, wherein each of the N subnets extends ~~over the cross sectional~~across a ~~area of the~~ corresponding subspace of the N subspaces.

14. (Currently amended) The ~~A~~ method as recited in claim 13, wherein:

each of the N subnets has a level; and

the levels of at least two of the N subnets differ from one another.

15. (Currently amended) ~~A~~ The method as recited in claim 14, wherein ~~the~~ positioning the catch net ~~positioning~~ comprises ~~setting~~ positioning each of the N subnets at a selected distance from ~~the top surface~~an end of the central string.

16. (Currently amended) ~~A~~ The method as recited in claim 2, wherein:

the space includes a base ~~surface~~ surface; and

~~the catch net positioning~~ positioning the catch net comprises spacing the catch net away from the base surface.

17. (Currently amended) The ~~A~~ method as recited in claim 16, wherein ~~the~~ spacing the catch net away from the base surface simulates a positioning of the catch net for a top layer of the placed particles.

18. (Currently amended) The ~~A~~ method as recited in claim 2, wherein: positioning the catch net ~~the catch net positioning comprises~~ comprises:

~~assigning an initial catch net position for a kth one of the subspaces $Z_{init}(k)$; assigning as the~~

~~characteristic dimension of the particles of a kth one of the particle categories a_k; assigning as the characteristic dimension of a small one of the particles a_{min} of the particles, and assigning as the characteristic dimension of a large one of the particles a_{max}; and~~

~~below a threshold level the catch net positioning further comprises~~ positioning the catch net for a k_{th} one of the particle categories at a catch net position $Z_{net}(k)$ within ~~a~~ a k_{th} one of the subspaces determined by $Z_{net}(k) = Z_{init} + H\ r\ a_k\ a_{min}/a_{max}$ ~~where r represents a weighting coefficient and H represents a switching coefficient~~;

wherein:

Z_{init} is an initial catch net position for a k_{th} one of the N subspaces;

a_k is a characteristic dimension of the particles of a k_{th} one of the particle categories;

a_{min} is a characteristic dimension of a small one of the particles;

a_{max} is a characteristic dimension of a large one of the particles;

r is a weighting coefficient; and

H is a switching coefficient.

19. (Currently amended) The ~~A~~ method as recited in claim 18, wherein the weighting coefficient is assigned a random number.

20. (Currently amended) The ~~A~~ method as recited in claim 18, wherein:

below ~~the~~ a threshold value the switching coefficient is assigned a value of one; and

above the threshold value the switching coefficient is assigned a value of zero.

21. (Currently amended) The ~~A~~ method as recited in claim 5, wherein the pack surface defining comprises:

selecting a top layer of the placed particles;

for each particle category k of the placed particles in the top layer, defining a particle radius a_i for the placed particles i of that ~~category k;~~ category k;

for the subspace k corresponding to the particle category k, assigning a cylinder ~~radius W_k;~~ radius W_k;

assigning a top layer particle number m(k) and determining values for m(k) by evaluating

$$\sum_{\substack{i=1 \\ Submode(i)\le k}}^{m(k)-1} a_i^2 < W_k^2 \le \sum_{\substack{i=1 \\ Submode(i)\le k}}^{m(k)} a_i^2 \ , \ k = 1, 2, \ldots, N$$

where N is the number of particle categories; and

determining the pack surface location using

$$S = \frac{1}{m}\sum_{i=1}^{m}(Z_i - a_i)$$

where S represents the pack surface and Z_i represents the position of a center of a center one of the placed spheres.

22. (Currently amended) The ~~A~~ method as recited in claim 5, wherein:

for a given particle category k and corresponding subspace k, the particle placement comprises contacting an ~~i$_{th}$~~ ith placed particle with the selected particle, the ~~i$_{th}$~~ ith placed particle having the characteristic dimension a_i and the selected particle having the characteristic dimension a_c;

the catch net comprises a subnet corresponding to the subspace k; and

if $a_i/a_c<1$, then the catch net positioning comprises positioning the subnet k for the ~~k$_{th}$~~ kth subspace $Z_{net}(k)$ at

$$Z_{net}(k) = S - a_i$$

where S represents the position of the pack surface.

23. (Currently amended) The ~~A~~ method as recited in claim 5, wherein:

for a given particle category k and corresponding subspace k, the particle placement comprises contacting an ~~i_{th}~~ ith placed particle with the selected particle, the ith placed particle having the characteristic dimension a_i and the selected particle having the characteristic dimension a_c;

the catch net comprises a subnet corresponding to the subspace k; and

if $1 \leq a_i/a_c < a_x$, where a_x represents a sample particle size for a corresponding sample particle that will fit into a cavity formed by placed spheres larger than the sample particle, then the catch net positioning comprises positioning the subnet k for the kth subspace $Z_{net}(k)$ at

$$Z_{net}(k) = S - 2a_c$$

where S represents the position of the pack surface.

24. (Currently amended) The ~~A~~ method as recited in claim 23, wherein the sample particle size a_x is assigned a value of $\sqrt{6} + 2$.

25. (Currently amended) The ~~A~~ method as recited in claim 5, wherein:

for a given particle category k and corresponding subspace k, the particle placement comprises contacting an ith placed particle with the selected particle, the ~~i_{th}~~ ith placed particle having the characteristic dimension a_i and the selected particle having the characteristic dimension a_c;

the catch net comprises a subnet corresponding to the subspace k; and

if $a_i/a_c \geq a_x$, where a_x represents a sample particle size for a corresponding sample particle that will fit into a cavity formed by placed spheres larger than the sample particle, then the catch net positioning comprises positioning the subnet k for the kth subspace $Z_{net}(k)$ at

$$Z_{net}(k) = S - 2a_c - a_i$$

where S represents the position of the pack surface.

26. (Currently amended) An apparatus for simulating placement of ~~placing~~ a plurality of unplaced particles, ~~each particle having a characteristic dimension, to create a particle pack, the plurality of particles comprising N categories of the particles, the characteristic dimension of the particles of a given category being different from the characteristic dimensions of the particles of other ones of the categories, the characteristic dimension of the particles increasing as the category N increases, the apparatus~~ comprising:

~~a)~~ an input device for inputting particle selection ~~information,~~ information;

~~b)~~ a storage device operatively coupled to the input device for storing the particle selection information; and

~~c)~~ a processor for repeatedly selecting a particle from the plurality of unplaced particles, for simulating placement~~placing~~ of the selected particle within a space ~~at a particle location unique to the selected particle in the corresponding subspace so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is~~ in a non-overlapping ~~relation~~ relationship with respect to ~~other~~ previously placed particles to form a plurality of placed particles, and for establishing a catch net representative of buoyancy of a portion of the plurality of placed particles and positioning the catch net within ~~the~~ a space based upon the placement of the portion of the plurality of placed particles, the processor configured for placing the selected particle ~~being placed~~ in non-overlapping ~~relation~~ relationship with respect to the catch net.

27. (Currently amended) A machine-readable medium for use in placing a plurality of unplaced particles, ~~each particle having a characteristic dimension, to create a particle pack, the plurality of particles comprising N categories of the particles, the characteristic dimension of the particles of a given category being different from the characteristic dimensions of the particles of other ones of the categories, the characteristic dimension of the particles increasing as the category N increases, the machine readable medium~~ comprising:

~~a)~~ machine executable instructions for defining a central string, a space disposed about the central string, and N ~~concentric~~ subspaces disposed about the central string and within the space, each of the N subspaces corresponding to one of ~~the~~ N ~~particle~~ categories of

the plurality of particles, wherein each of the N categories corresponds to a characteristic dimension of the plurality of unplaced particles;

~~b)~~ wherein the machine executable instructions are configured for repeatedly selecting a particle from the plurality of unplaced particles~~;~~

~~c) machine executable instructions for placing~~ and simulating placement of the selected particle ~~at a particle location unique to the selected particle in the corresponding~~ in a subspace of the N subspaces corresponding to the one category of N categories ~~so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is~~ in a non-overlapping ~~relation~~ relationship with ~~other~~ previously placed particles, to form a plurality of placed particles; and

wherein the ~~selected particle placement instructions including~~machine executable instructions are configured for ~~instructions for~~ defining a catch net representative of buoyancy of a portion of the plurality of ~~-~~placed particles and positioning the catch net within the space based upon the placement of the portion of the plurality of placed particles, the selected particle being placed in non-overlapping relation with respect to the catch net.~~net; and~~

~~d) machine executable instructions for repeating the particle selection (b) and placement (c) instructions until each of the particles of the plurality of particles has become one of the placed particles.~~

28. (Currently amended) A ~~machine implemented~~ method for simulating placement of ~~placing~~ a plurality of particles, the method comprising:

selecting a plurality of unplaced particles;

wherein each of the plurality of unplaced particles exhibits ~~having~~ a characteristic dimension, ~~to create a particle pack, the plurality of particles comprising~~ corresponding to N categories of the plurality of unplaced ~~particles,~~particles;

wherein the characteristic dimension of each of the plurality of unplaced particles of a given category of the N categories ~~being~~is different from the characteristic ~~dimensions~~ dimension of each of the plurality of particles of other ~~ones~~ of the N categories;~~categories, the characteristic dimension of the particles increasing as the category N increases, the method comprising:~~

~~a)~~ defining a central string, a space disposed about the central string, and N ~~concentric~~ subspaces disposed about the central string and within the space, wherein each of the N subspaces ~~corresponding~~ corresponds to one of the N ~~particle~~ categories;

~~b)~~ selecting a particle from the plurality of unplaced particles;

~~c) placing the selected particle in the corresponding subspace so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is in non-overlapping relation with other placed particles, the selected particle placement including~~ defining a water level representative of a level of a portion of ~~the~~ a plurality of placed particles that are smaller than the selected ~~particle~~ particle;~~and represent a surface of the smaller placed particles, and positioning the water level within the space based upon the smaller particle surface, the selected particle being placed in non-overlapping relation with respect to the water level;~~

simulating placement of the selected particle within a corresponding subspace so that the selected particle is positioned in a non-overlapping relationship with respect to the plurality of placed particles and the water level; and

~~d) repeating~~ repeatedly ~~the particle selection (b) and placement (c)~~ selecting another particle from the plurality of unplaced particles and simulating placement thereof until each of the particles of the plurality of unplaced particles has ~~become one of the placed particles~~been simulated.

29. (Currently amended) The ~~A~~ method as recited in claim 28, wherein each of the plurality of unplaced particles ~~comprise~~comprises a ~~spheres~~ sphere and the characteristic dimension of each of the plurality of unplaced particles comprises a radius.

30. (Currently amended) The ~~A~~ method as recited in claim 28, wherein:

~~the water level~~ positioning the water level comprises determining an average location of the particle locations along the central string of the plurality of placed particles ~~of the portion of placed particles~~ and positioning the water level at the average location.

31. (Currently amended) The ~~A~~ method as recited in claim 28, wherein:

the water level comprises a plurality of subspace water levels ~~corresponding to a portion of the subspaces,~~ wherein each of the plurality of subspace water levels ~~corresponding~~ corresponds to one of the N subspaces, respectively ~~of the portion of subspaces~~; and

~~the water level~~ positioning the water level comprises ~~assigning a subspace water level position~~ positioning ~~to~~ each of the plurality of subspace water levels.

32. (Currently amended) The ~~A~~ method as recited in claim 31, wherein:

each of the N subspaces ~~of the portion of subspaces~~ comprises a subspace surface representative of ~~the~~ a portion of ~~the smaller~~ placed particles ~~within that subspace~~therein, each of the subspace surfaces comprising a subspace surface location with respect to the central string;

each of the plurality of placed particles comprises a north pole having a north pole location; and

the subspace water level position for one of the subspaces ~~i~~ is ~~in the portion of the subspaces~~ determined by determining an average location of the north pole locations of the portion of the plurality of placed particles within the one subspace ~~i~~ and assigning the average location ~~as~~of the subspace surface location for the one ~~subspace i.~~subspace.

33. (Currently amended) ~~A~~ The method as recited in claim 31, wherein:

each of the N subspaces ~~of the portion of subspaces~~ comprises a subspace surface representative of ~~the~~ a portion of the smaller placed particles within that subspace, each of the subspace surfaces comprising a subspace surface location with respect to the central string;

each of the plurality of placed particles comprises a south pole having a south pole location; and

the subspace water level position for one of the subspaces ~~i is in the portion of the subspaces~~ is determined by determining an average location of the south pole locations of the portion of the plurality of placed particles within the one subspace ~~i~~ and assigning the average location as the subspace surface location for ~~subspace i.~~the one subspace.

34. (Currently amended) ~~A~~ The method as recited in claim 28, wherein:

~~the water level~~ positioning the water level comprises using an offset to position the water level.

35. (Currently amended) A method as recited in claim 31, wherein:

~~the water level~~ positioning the water level comprises using an offset for each of the subspace water level positions.

36. (Currently amended) An apparatus for ~~placing~~ simulating placement of a plurality of unplaced particles, ~~each particle having a characteristic dimension, to create a particle pack, the plurality of particles comprising N categories of the particles, the characteristic dimension of the particles of a given category being different from the characteristic dimensions of the particles of other ones of the categories, the characteristic dimension of the particles increasing as the category N increases, the apparatus~~ comprising:

~~a)~~ an input device for inputting particle selection ~~information,~~ information;

~~b)~~ a storage device operatively coupled to the input device for storing the particle selection information; and

~~c)~~ a processor for selecting a particle from the plurality of particles, for placing the selected particle in the corresponding subspace so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is in non-overlapping relation with other placed particles, for establishing a water level representative of a level of a portion of the placed particles that are smaller than the selected particle and represent a surface of the smaller placed particles, and for positioning the water level within the space based upon the smaller particle surface, the selected particle being placed in non-overlapping relation with respect to the water level.

37. (Currently amended) A machine-readable medium for use in simulating placement of ~~placing a~~ plurality of unplaced particles, ~~each particle having a characteristic dimension, to create a particle pack, the plurality of particles comprising N categories of the particles, the characteristic dimension of the particles of a given category being different from the characteristic dimensions of the particles of other ones of the categories, the characteristic dimension of the particles increasing as the category N increases, the machine-readable medium~~ comprising:

~~a)~~ machine executable instructions for defining a central string, a space disposed about the central string, and N ~~concentric~~ subspaces disposed about the central string and within the space, each of the N subspaces corresponding to one of the N particle categories;

~~b)~~ wherein the machine executable instructions are configured for repeatedly selecting a particle from the plurality of ~~particles;~~particles

~~c) machine executable instructions for placing~~ and simulating the placement of the selected particle ~~at a particle location unique to the selected particle in the corresponding~~ in a subspace of the N subspaces of the corresponding category of N categories ~~so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is~~ in non-overlapping relation with ~~other~~ previously placed particles, to form a plurality of placed particles; and

wherein the machine executable ~~the selected particle placement instructions including instructions~~ are configured for defining a water level representative ~~of a level~~ of a portion of the plurality of placed particles that are smaller than the selected particle and represent a surface of the ~~smaller~~ portion of the plurality of placed ~~particles,~~particles and for positioning the water level within the space based upon the smaller particle surface, the selected particle being placed in non-overlapping relation with respect to the water ~~level; and~~level.

~~d) machine executable instructions for repeating the particle selection (b) and placement (c) instructions until each of the particles of the plurality of particles has become one of the placed particles.~~

38. (New) The method as recited in claim 1, wherein the N subspaces each comprise a cylindrical subspace positioned concentrically with respect to the central string.

39. (New) A method for simulating the placement of a particle, the method comprising:

defining a central string and a space having a cylindrical boundary wall disposed about the central string;

defining a plurality of cylindrical subspaces disposed about the central string and within the space, wherein each of the subspaces has a cylindrical boundary wall;

wherein the space includes a plurality of previously placed particles;

defining a water level representative of a level of a portion of the plurality of previously placed particles having a size which is smaller than the selected particle;

simulating movement of a particle within the space from an initial position and in a selected direction;

simulating contact of the particle with at least one of the cylindrical wall of the space, the water level, the cylindrical wall of one of the plurality of subspaces, and at least one of the plurality of previously placed particles; and

determining stable placement of the particle within the space.

40. (New) The method as recited in claim 39, wherein simulating contact of the particle with at least one of the cylindrical wall of the space, the water level, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles comprises simulating rolling of the particle with respect to at least one of the cylindrical wall of the space, the water level, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles.

41. (New) The method as recited in claim 39, wherein simulating contact of the particle with at least one of the cylindrical wall of the space, the water level, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles comprises determining whether contact of the particle with at least one of the cylindrical wall of the space, the water level, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles is compressive or tensile.

42. (New) The method as recited in claim 39, wherein simulating movement of the particle within the space from the initial position and in the selected direction comprises simulating movement of the particle within the space in a direction parallel to the central string.

43. (New) The method as recited in claim 39, wherein simulating movement of the particle within the space from the initial position and in the selected direction comprises constraining a center of the particle to remain within one of the plurality of cylindrical subspaces during simulating movement thereof.

44. (New) The method as recited in claim 39, further comprising:

defining a catch net representative of buoyancy of a portion of the plurality of placed particles and positioning the catch net within the space based upon the placement of the portion of the plurality of placed particles.

45. (New) A method for simulating the placement of a particle, the method comprising:

defining a central string and a space having a cylindrical boundary wall disposed about the central string;

defining a plurality of cylindrical subspaces disposed about the central string and within the space, wherein each of the subspaces has a cylindrical boundary wall;

wherein the space includes a plurality of previously placed particles;

defining a catch net representative of a buoyancy of a portion of the plurality of previously placed particles and positioning the catch net within the space based upon the placement of the portion of the plurality of previously placed particles;

simulating movement of a particle within the space from an initial position and in a selected direction;

simulating contact of the particle with at least one of the cylindrical wall of the space, the catch net, the cylindrical wall of one of the plurality of subspaces, and at least one of the plurality of previously placed particles; and

determining stable placement of the particle within the space.

46. (New) The method as recited in claim 46, wherein simulating contact of the particle with at least one of the cylindrical wall of the space, the catch net, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles comprises simulating rolling of the particle with respect to at least one of the cylindrical wall of the space, the catch net, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles.

47. (New) The method as recited in claim 46, wherein simulating contact of the particle with at least one of the cylindrical wall of the space, the catch net, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles comprises determining whether contact of the particle with at least one of the cylindrical wall of the space, the catch net, the cylindrical wall of one of the plurality of subspaces, and the at least one of the plurality of previously placed particles is compressive or tensile.

48. (New) The method as recited in claim 46, wherein simulating movement of the particle within the space from the initial position and in the selected direction comprises simulating movement of the particle within the space in a direction parallel to the central string.

49. (New) The method as recited in claim 46, wherein simulating movement of the particle within the space from the initial position and in the selected direction comprises constraining a center of the particle to remain within one of the plurality of cylindrical subspaces during simulating movement thereof.

50. (New) The method as recited in claim 46, further comprising:

defining a water level representative of a level of a portion of the plurality of previously placed particles having a size which is smaller than the selected particle.